Idaho Department of Health and Welfare
Division of Medicaid
Bureau of Developmental Disability Services

Adult Developmental Disabilities Individualized Budget Model Analysis

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IDAHO DEPARTMENT OF
HEALTH & WELFARE

Idaho Medicaid Adult DD Individual Budget Review Analysis

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Overview

Idaho Division of Medicaid has developed an Adult Development Disabilities (DD) Individualized Budget model which provides each participant with an individual budget amount based on mathematical equation that was derived from a multi-regression model which calculates a level of funding for each participant, according to the selected items of his or her needs based on the 'Individual Needs Inventory Adults with Developmental Disabilities (12-6-05) assessment.

This review and analysis of the individual needs inventory and budget model has the purpose to examine the fit of the current model and to see if there are any possible improvements that could be suggested based on the finding of this analysis.

Definitions

PYB = Previous Years Budget
CPA = Calculated Budget Amount
R^2 = Coefficient of determination, the portion of variation in the dependent variable that is explained by the relationship to the independent variable(s).
Residuals = The difference between the actual value of the dependent variable and the predicted value.

Data

In August 2008, a complete dataset was provided from the DD data entry contractor of the Adult DD Inventory Database (total data entries n=4,481 (includes multiple plan years for participants)). From that database those entries that had a plan start date within 2007 was used to derive a dataset for the analysis (2007 plan date n=2,177). From that 2007 dataset a process of cleaning, selecting those who had PYB greater than $0.00 and a Paid DD Claims[1] amount greater than $0.00 (n=1,835) then those who had a Paid DD + Trans Claims[2] greater or equal to $500.00 (n=1,820) were selected. From that dataset a bivariate liner regression model was ran comparing the PYB amount with the 2007 Paid Claims[2]. Figure1 is a scatter-plot showing how the PYB and the DDTrans Paid x 12 amount relate to each other, which is rather well with a R^2 = 0.754, however, as we can see that PYB ≠ DD + Transportation Claims. This indicates that the PYB does not necessary represent the 'needs' of the participant, for if the PYB were to capture the total need we should expect a higher correlation, such as .90 or higher even with the fact that PYB is based on the pervious year.

[1] Based on DD paid claims within CY2007, (Total DD Paid Amount/Number of months)*12 = DDPaidx12
[2] DD and transportation cost x 12 month (Total DD+Trans Paid Amount/Number of months)*12 = DDTransPaidx12

Idaho Medicaid Adult DD Individual Budget Review Analysis

For Internal Use Only

1/20/2009

Figure 1

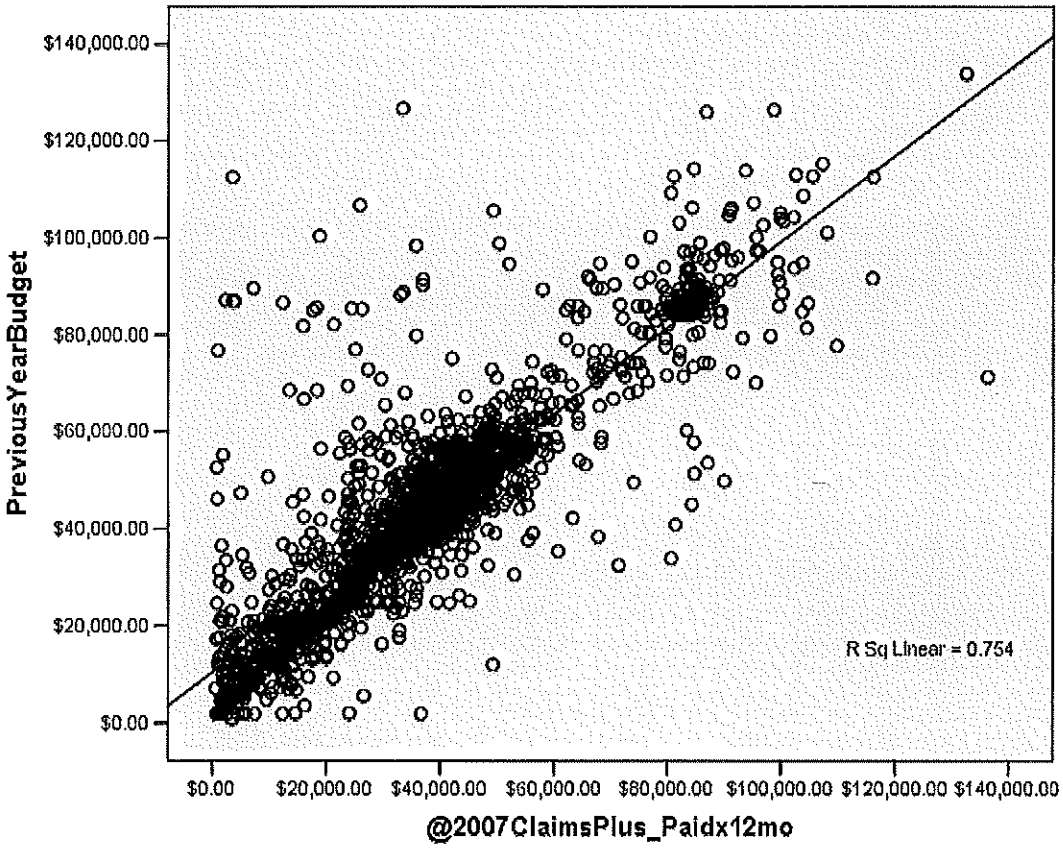
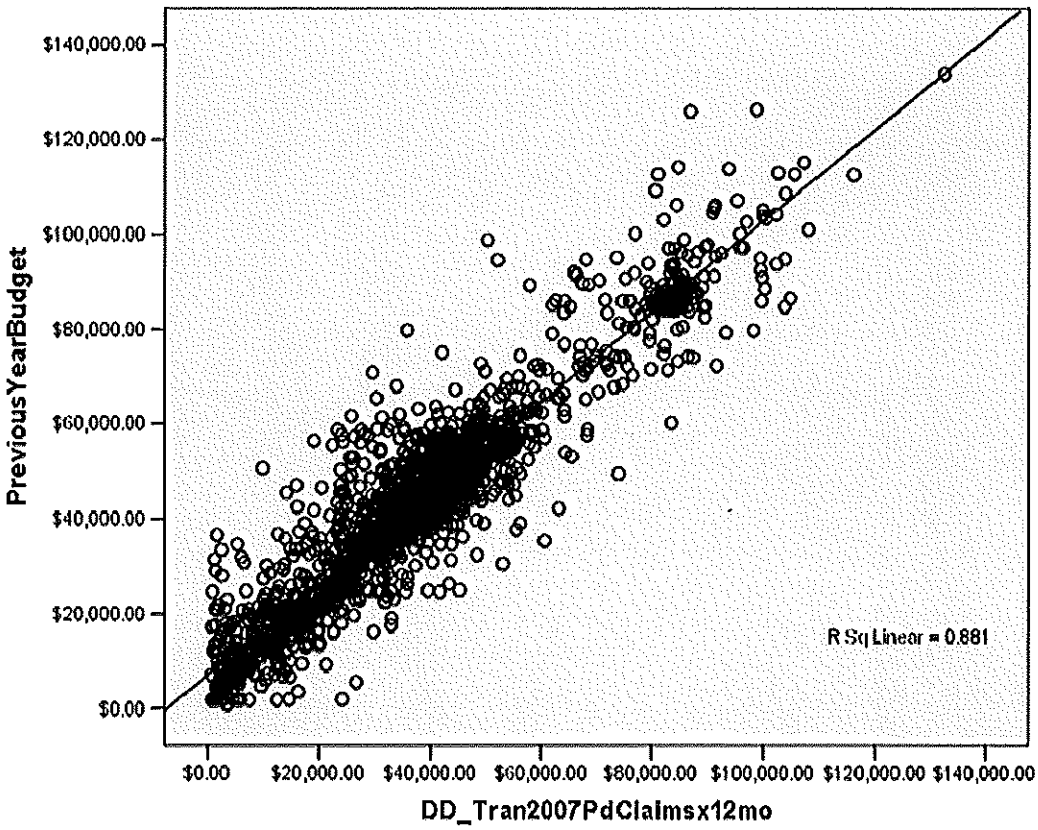
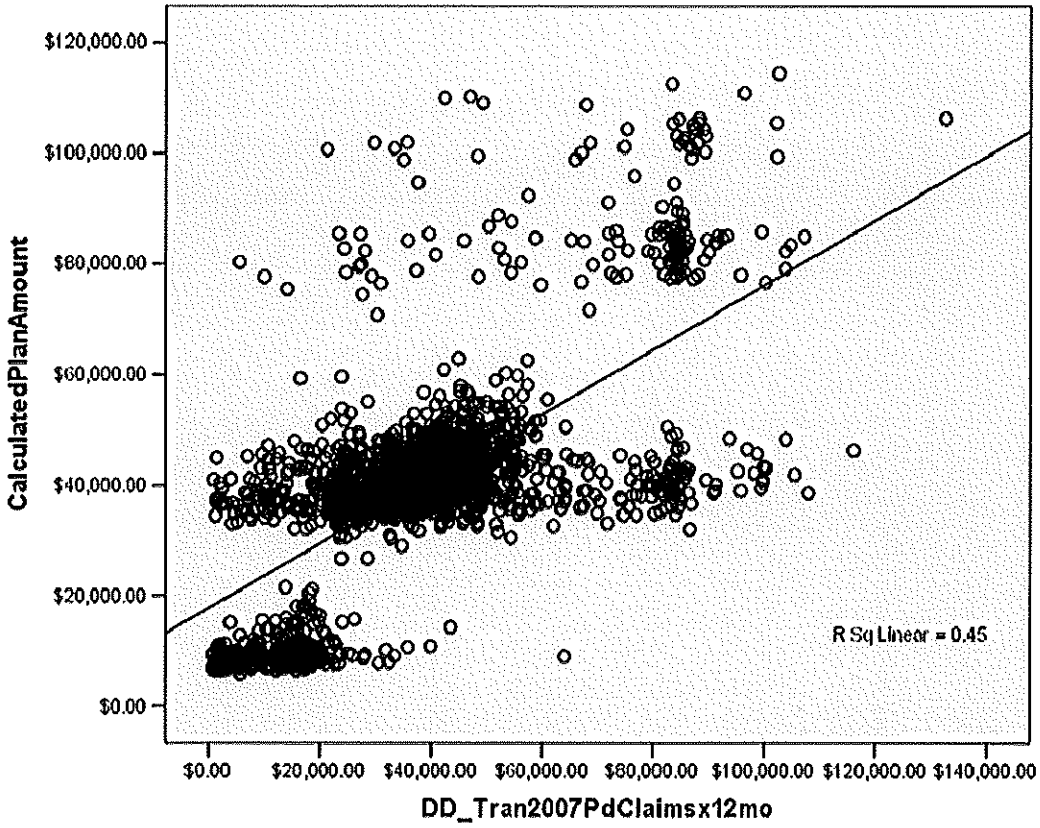


Figure 2



To further clean the data the cases that were found to be outliers were excluded (48 cases), based the regression model residual analysis of those that were outside 3 standard deviations of the regression residual trend line. The data with excluded outliers derived a dataset of a n=1,772 (dataset A), Figure 2 shows a scatter-plot of this data without outliers comparing the PYB amount with the 2007 DDTrans Paid Claims, which resulted in an R^2=0.881, this means that the PYB and DD + Transportation claims (without outliers) are highly correlated which is to be expected. There may be several reasons for this high correlation one of which is that the PYB accurately reflects the service needs of the participant and is then transcribed as paid claims, or another case may be that the PYB is an amount that the participant can utilize, thus will utilize and that utilization whether needed or desired is then reflected in the paid claims. The goal of the Calculated Plan Amount (CPA) is to predict the need of the participant. With the predicted CPA we should also find a high correlation between the CPA and the paid claims amount, albeit not as high of a correlation as the PYB and the paid claims.

Figure 3



With the data set of n=1,772 (dataset A), Figure 3 shows a scatter-plot of the CPA from the Individualized Budget Calculation tool that is currently being used and then is entered into the Inventory Needs database. The R^2=0.45, this indicates a moderate strong correlation and means that the current CPA is a rather good model that captures the direction of the what the participant's DD and transportation costs are for that plan year. However, as we could see by the scatter-plot the CPA has a tendency to group the participants within a CPA range, which suggest that the CPA could be improved upon to capture a little more detail of the participant's needs to estimate their individual DD and transportation claims costs and should show an ungrouping of the predicted cost.

Idaho Medicaid Adult DD Individual Budget Review Analysis

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1/20/2009

The current CPA model that is used in the Individualized Budget Calculation tool consist of 10 stand alone variables with 8 more variables used in the functional Score category. The regression model equation is:

$Y = b_1*x_1 + b_2* x_2 + b_3*x_3 + b_4*x_4 + b_5*x_5 + b_6*x_6 + b_7*x_7 + b_8*x_8 + b_9* x_9 + x_{10} + b_{11}*x_{11} + b_{12}* x_{12}$

Where:

	Model Coefficients	
y = Calculated Plan Amount (Annual)	Waiver	Nonwaiver
x1 = Waiver Status (Waiver=25,628.54 , Nonwaiver=6,211.20)	25,628.54	6,211.20
x2 = General Maladaptive Index (GMI) (GMI * var)	-148.68	-57.16
x3 = Mental Retardation	5,879.85	0
x4 = Autism	4,389.63	0
x5 = Cerebral Palsy	5,573.41	0
x6 = TBI	2,672.81	0
x7 = High Risk Behavior	2,139.01	0
x8 = Nursing		
Nursing monthly	39,855.20	0
Nursing weekly/daily	61,204.97	0
x9 = Level of Support Needed	908.68	0
x10 = Transportation	inputed $	inputed $
x11 = Sum of Bathing, Grooming, Dressing, Toileting and Feeding (x*var)	167.26	458.47
x12 = Sum of Laundry, Housekeeping, and Meal Prep (x*var)	0	358.2

From dataset A (n=1,772) based on 5% methodology where if the CPA was outside a ±5% margin from the PYB, then the PYB would be used rather than the CPA, we find in dataset A that 13.5% used the CPA and 86.5% was reverted to use the PYB.

Budget Group	Cases	Percent
Used CPA	239	13.5%
Used PYB	1533	86.5%
Total	1772	

Of those that reverted back to the PYB (>±5% difference between CPA and PYB) 39.3% were those that the CPA was greater than the PYB and 60.7% were those that the CPA was less than PYB. This suggests that of those with a greater than ±5% difference, the CPA tends to predict a lower amount 61% percent of the time.

Although, the PYB and DD+Transportation Paid Claims are highly correlated they do not equal each other. With the same dataset the percent difference between PYB and the DD + Transportation Paid Claims was compared, and we find that 16.5% were within 5% of each other and 83.5% was greater that ±5% difference. Out of the 83.5% that were outside, 11.0% of the PYB was less than the DD +Trans Paid Claims amount and 89.0% of the PYB was more than the DD +Trans Paid Claims amount. This indicates

that there is a tendency for the PYB amount to be higher than the actual paid claims amount (DD + Transportation claims).

With the tendency of the PYB to be higher than the actual paid claim amount and the tendency that the CPA tends to be lower then the PYB, this means that we are on the right track in using a CPA to provide a Plan Amount that is closer aligned to the claims amount, which should be closer to measure the 'need' of the participant.

The selection of whether or not to use the CPA over the PYB using the ± 5% methodology raises some concerns and lends itself to under cut the Individualized Budget Process. Where the CPA may be aligning the Plan Amount to the 'need' of the participant and in cases where a percent of difference of greater than ± 5%, i.e. -10.3% and the dollar difference was $4,565.65, where the PYB was $48,745.83 and the CPA was $44,180.18 and because the percent difference was > ± 5% the Plan Amount was reverted to the PYB or $48,745.83. Which Plan is the better one to use; perhaps it depends on which represents the closest to what matches the 'need', the claims paid amount. In this case it was the CPA (the DD+Trans Paid amount was $38,688.16). Granted that is not always the case. However, the point is that the Individualized Budget Process modeling is intended predict the annual cost of the 'need' of the participant and not necessarily the PYB. In cases where the individual inventory does not capture the magnitude of the participants need (things not captured by the inventory) then there should be a way to refer to a Plan Amount that more accurately reflects the 'need', i.e. the PYB may closer reflect the 'need' Plan Amount. Thus, the PYB should be included as a test variable within the Budget Calculation Tool, although not limited to a ± 5% margin.

New Model

The other goal of this analysis was to examine if we could modify the CPA model to gain a higher predictive model that could be used to calculate the New CPA (NCPA). To do this we are interested in two things, one to see if the R^2 could be increased with our new dataset by utilizing the variables from the DD inventory, and two, this may come in part from the ungrouping of the CPA that we see in Figure 3. Working with the dataset A (n=1,772) we find that there is a limit to which our inventory data could strengthen our regression model, nevertheless, it provides us with a framework which we could reasonably predict an anticipated plan cost based on the individual inventory.

From the inventory data that was entered into the inventory database, the data was coded into numeric variables which then could be used in the multi-regression model. In order to attempt to spread the groupings from Figure 3 each data element that consisted of more than a two options answer, each option was created into its own data element. For example in Figure 4, Question number 17 on the 'Individual Needs Inventory', "Need for Nursing Services: Does the individual have a need for nurse intervention?", each answer option; No Services Needed, Monthly, Weekly, and Daily, each were codes as no=0 and yes=1.

Figure 4

(Original Input) Nursing Services	0 Nursing NoServ	1 Nursing Monthly	2 Nursing Weekly	3 Nursing Daily
1	0	1	0	0
0	1	0	0	0
2	0	0	1	0

Using the 2007 DD and transportation paid claims x 12 amount as the dependent variable and the useable numerical variables from the inventory data as independent variables, several iterations of regressions methods were processed; enter, stepwise, backward, and forward, in order to find which method would yield the best model. The best model derived was from the stepwise method, which is a method that brings in and takes out variables to present the best fitted model based on the combination of the independent variables that were found to affect the dependent variable. After 21 iterations of the stepwise method regression model the best fit was found and it derived the below model (Figure 5 identified as model 1, in order to just show the best fit model).

There are a few key statistics that indicates the 'goodness' of the model, the R, R^2, Adjusted R^2, F-value, and the statistical significant. This model has a strong R of .756 which measures the direction (i.e. positive relation) and strength of the liner relationship, and a moderate strong Adjusted R^2 of .567 (Figure 5), which identifies the amount of variation that is explained by the model, the F-value is 111.313, which is fairly strong and signifies that the model explains more than it doesn't and finally the model is significant at the p value <.001 level (Figure 6). These statistics suggest that the model is a good model that accounts for the DD and Transportation claim costs.

Figure 5

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.756[a]	.572	.567	$14,870.17584

a. Predictors: (Constant), CoOccurringMentalHealthDiagnosis, SupportOnetoOne, TransportationDistance, Trans67day, SupportNone, ComplexMedicalCondition, NS_3, Laundry2, CerebralPalsy, NursingMonthly, HighRiskBehavior, TransNone, SupportPart, PsychotropicMeds, Mobility_Level_3, GMI, Laundry4, Waiver, Trans45day, BIAge, NursingNoServ

b. Dependent Variable: DD_Tran2007PdClaimsx12mo

Figure 6

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5E+011	21	2.461E+010	111.313	.000[a]
	Residual	4E+011	1750	221122129.7		
	Total	9E+011	1771			

a. Predictors: (Constant), CoOccurringMentalHealthDiagnosis, SupportOnetoOne, TransportationDistance, Trans67day, SupportNone, ComplexMedicalCondition, NS_3, Laundry2, CerebralPalsy, NursingMonthly, HighRiskBehavior, TransNone, SupportPart, PsychotropicMeds, Mobility_Level_3, GMI, Laundry4, Waiver, Trans45day, BIAge, NursingNoServ

b. Dependent Variable: DD_Tran2007PdClaimsx12mo

The below table (Figure 7) shows the variables that were found to contribute to the amount paid for DD services and transportation services, as well as the coefficient values. These beta coefficients are to be understood as the amount increase or decrease to the dependent variable (DD + Tran Paid claims) based on 1 unit increases of the independent variables (inventory data). The unstandardized beta coefficients are the 'weights' to be applied to the DD inventory values that will used to calculate the NCPA. The section in the table that is under the lower and upper bounds are different 'weights' based on a margin within 95% Confidence Interval. This means that we are 95% confident that the NCPA will fall within the lower and upper bounds of the regression trend line.

Figure 7

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	54965.647	3280.963		16.753	.000	48530.627	61400.667		
	Waiver	12125.909	1393.724	.202	8.700	.000	9392.369	14859.450	.452	2.212
	NursingNoServ	-29359.8	2477.659	-.368	-11.850	.000	-34219.239	-24500.273	.256	3.904
	NS_3	-11117.5	1039.398	-.191	-10.696	.000	-13156.102	-9078.919	.771	1.297
	SupportPart	-9697.655	1011.465	-.196	-9.588	.000	-11681.462	-7713.849	.585	1.709
	GMI	-169.956	34.601	-.095	-4.912	.000	-237.819	-102.094	.658	1.520
	SupportNone	-15788.3	2673.196	-.105	-5.906	.000	-21031.297	-10545.308	.773	1.294
	HighRiskBehavior	8462.722	1400.334	.109	6.043	.000	5716.217	11209.227	.758	1.320
	CerebralPalsy	4762.491	1150.123	.071	4.141	.000	2506.731	7018.251	.823	1.215
	Trans67day	13856.016	2505.757	.095	5.530	.000	8941.424	18770.607	.821	1.218
	Laundry2	3534.435	944.017	.066	3.744	.000	1682.916	5385.954	.796	1.257
	TransNone	5574.928	1200.798	.118	4.643	.000	3219.779	7930.078	.376	2.659
	Mobility_Level_3	4268.424	1458.229	.056	2.927	.003	1408.370	7128.478	.659	1.517
	PsychotropicMeds	2240.763	838.633	.049	2.672	.008	595.935	3885.592	.717	1.394
	NursingMonthly	-9717.775	2785.223	-.106	-3.489	.000	-15180.489	-4255.060	.285	3.773
	Laundry4	-4024.600	944.775	-.085	-4.260	.000	-5877.605	-2171.594	.610	1.640
	BIAge	-684.918	194.435	-.092	-3.523	.000	-1066.267	-303.569	.356	2.809
	TransportationDistance	3548.321	1248.220	.046	2.843	.005	1100.162	5996.480	.923	1.083
	Trans45day	2618.118	1176.473	.058	2.225	.026	310.678	4925.558	.361	2.773
	SupportOnetoOne	3329.310	1379.699	.042	2.413	.016	623.279	6035.341	.798	1.253
	ComplexMedical Condition	-3695.702	1550.013	-.038	-2.384	.017	-6735.775	-655.628	.940	1.064
	CoOccurringMental HealthDiagnosis	2038.323	1005.852	.036	2.026	.043	65.524	4011.122	.772	1.296

a. Dependent Variable: DD_Tran2007PdClaimsx12mo

Idaho Medicaid Adult DD Individual Budget Review Analysis

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1/20/2009

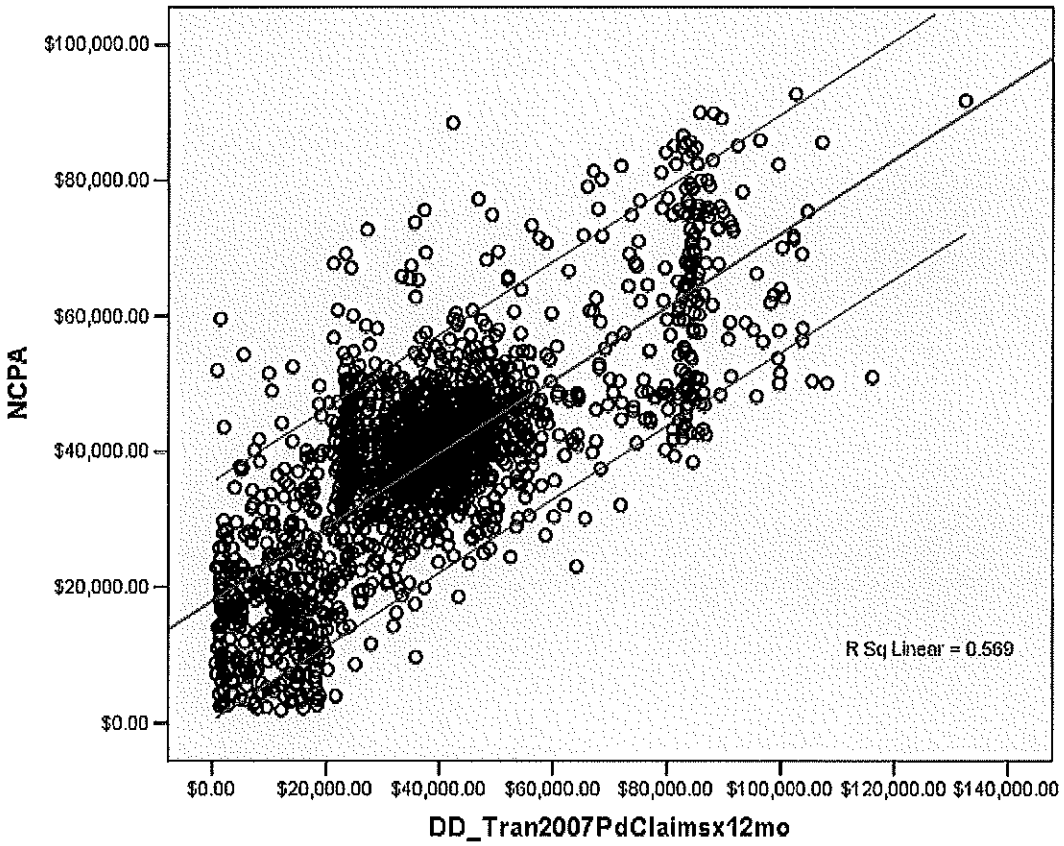
The NCPA regression model equation is $Y = a + b_1*x_1 + b_2*x_2 + b_3*x_3 + \ldots.b_{20}*x_{20} + b_{21}*x_{21}$

Where:

Y = New Calculated Plan Amount (Annual)	Model Coefficients	X values	Coefficients based on 95% CI Lower Margin	Upper Margin
a = Constant	$54,965.65		$48,530.63	$61,400.67
x1= Waiver	$12,125.91	yes = 1, no = 0	$9,392.37	$14,859.45
x2= Nursing No Services	($29,359.80)	yes = 1, no = 0	($34,219.24)	($24,500.27)
x3= Natural Supports Over 22 hrs per week	($11,117.50)	yes = 1, no = 0	($13,156.10)	($9,078.92)
x4= Support Part of the day	($9,697.66)	yes = 1, no = 0	($11,681.46)	($7,713.85)
x5= GMI	($169.96)	inputed value	($237.82)	($102.09)
x6= Support None	($15,788.30)	yes = 1, no = 0	($21,031.30)	($10,545.31)
x7= High Risk Behavior	$8,462.72	yes = 1, no = 0	$5,716.22	$11,209.23
x8= Cerebral Palsy	$4,762.49	yes = 1, no = 0	$2,506.73	$7,018.25
x9= Transportation 6-7 days per week	$13,856.02	yes = 1, no = 0	$8,941.42	$18,770.61
x10= Laundry Supervision	$3,534.44	yes = 1, no = 0	$1,682.92	$5,385.95
x11= Transportation none	$5,574.93	yes = 1, no = 0	$3,219.78	$7,930.08
x12= Mobility, always requires assistance	$4,268.42	yes = 1, no = 0	$1,408.37	$7,128.48
x13= Psychotropic Medications	$2,240.76	yes = 1, no = 0	$595.94	$3,885.59
x14= Nursing Services Monthly	($9,717.78)	yes = 1, no = 0	($15,180.49)	($4,255.06)
x15= Laundry Total Support	($4,024.60)	yes = 1, no = 0	($5,877.61)	($2,171.59)
x16= BI Age	($684.92)	Inputed value	($1,066.27)	($303.57)
x17= Transportation Distance over 20 miles per day	$3,548.32	yes = 1, no = 0	$1,100.16	$5,996.48
x18= Transportation 4-5 days per week	$2,618.12	yes = 1, no = 0	$310.68	$4,925.56
x19= Support one on one	$3,329.31	yes = 1, no = 0	$623.28	$6,035.34
x20= Complex Medical Condition	($3,695.70)	yes = 1, no = 0	($6,735.78)	($655.63)
x21= Co Occurring Mental Health Diagnosis	$2,038.32	yes = 1, no = 0	$65.52	$4,011.12

The regression model coefficients are not the absolute independent dollar value contributable to the total amount of the dependent variable, but rather a relation value between the variables, that in combination of the other independent variables they contribute to the dependent variable. In other words, based on the participant's inventory values and the application of these coefficients, this is what is used to predict the participants Plan Amount or NCPA. If the NCPA was less than $1,813.78 (based on the second lowest (non-fluke value) PYB amount within the dataset) then the NCPA Upper Margin (NCPA_UM) was used. This NCPA with the NCPA_UM applied were applicable (40 or 2% of the cases) and were compared with the DD + transportation paid claims and in a scatter-plot, Figure 8, we find that there is $R^2 = .569$ which was an improvement from the R^2 of the CPA ($R^2 = .45$) and we find that the NCPA was able to correct some of the grouping we were having with the CPA (Figure 3).

Figure 8



The blue line in Figure 8 is the regression trend line, the red lines are the lower and upper bounds of the 95% confidence interval. The NCPA does pretty well at estimating the annual claim cost for DD and transportation services, but there is a larger margin where the NCPA falls within compared to Figure 2, where the PYB was within a tighter margin of the DD + Transportation costs. What this means is that based on the inventory variables has a limit to it precise predictability; there are factors outside the inventory that guide the costs. Given this issue, what is called for is use the PYB as a reference to evaluate whether or not the NCPA is capturing a major driving factors of cost for the DD participate.

One way to use the PYB as a reference, is to see how much difference there is between the NCPA and the PYB (similar to the 5% method), if there is a large difference then this would indicate that the PYB may capturing something that the NCPA may not (outside the inventory) that influences the annual costs. The Figure 9 table is the summary of the residual statistics, the standard deviation of the model residual (17,083.97) which is 55% of the mean. Using this standard, a margin test was developed using the percent difference between the NCPA and the PYB. Where if the NCPA was

beyond -55% away from the PYB then the NCPA_UM (upper margin) was used (17%) rather than the original NCPA (79%) and if the NCPA and PYB percent difference was greater than 55% then the NCPA_LM (lower margin) was used (4%) rather than the original NCPA. Thus, 79% of the cases used the original NCPA, 17% reverted to the upper margin of the NCPA, and 4% reverted to the lower margin of NCPA.

Figure 9

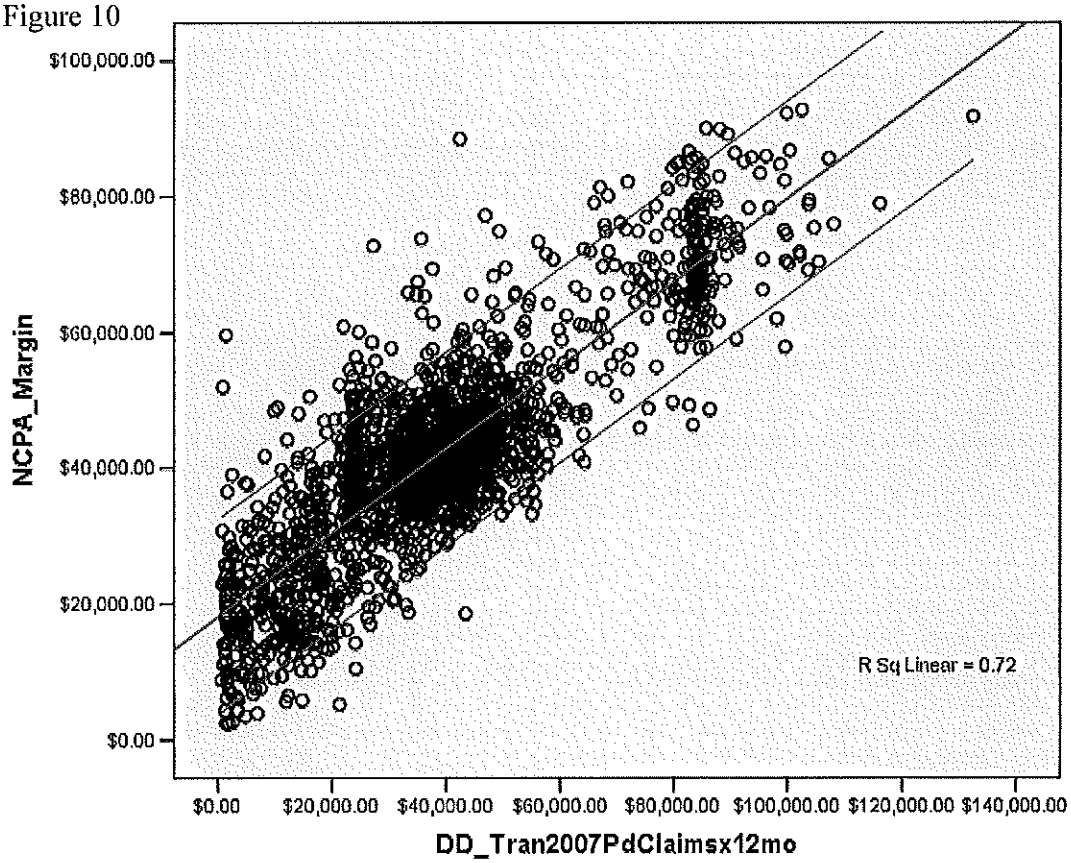
Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-$5,937.1245	$92,727.0859	$38,200.5535	$17,083.96656	1772
Residual	-$58,163.31250	$65,162.19531	$.00000	$14,781.74983	1772
Std. Predicted Value	-2.584	3.192	.000	1.000	1772
Std. Residual	-3.911	4.382	.000	.994	1772

a. Dependent Variable: DD_Tran2007PdClaimsx12mo

The below scatter-plot (Figure 10) shows the relation between the DD+Trans paid and the NCPA with the margin applied where applicable. Using this method tends to reign in the cases where the NCPA did not capture all factors that impact the paid claims, but also provides a greater degree in which the NCPA to be used as the participant's individual needs budget. As seen by the scatter-plot that using this method reflects a strong correlation of $R^2 = 0.72$ between the budget amount and the claim amount.

Figure 10



Other possible Models

Based on previous preliminary analysis we found that the participant's geographical residence may play a role in the affects of the plan cost, where the further out they lived from their services, the more they use transportation, and thus a higher plan cost. However, that affect did not contribute a great deal to the predictability to the model, based on the fact those who reside a distance from the services may travel less, than those who reside closer and may travel more frequent, thus, netting out the affects of the transportation costs, where participants who reside further away from the services may have just as much transportation costs as those who reside closer.

We had also seen from previous analysis that the Living Arrangements (CFH, SL1-SL3), did have major affect of the plan costs. The below model output shows that by including the Living Arrangement, the predictive model dramatically improves to a strong Adjusted R^2=.79, F-value of 250.35, and significance at the <.001 level.

Figure 11

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.891[a]	.793	.790	$10,262.59292

a. Predictors: (Constant), SL3, SL1, SupportNone, CerebralPalsy, TransportationDistance, ComplexMedicalCondition, Laundry2, Trans67day, NS_3, CoOccurringMentalHealthDiagnosis, SupportOnetoOne, HighRiskBehavior, TransNone, NursingMonthly, PsychotropicMeds, SupportPart, Mobility_Level_3, GMI, Laundry4, SL2, Waiver, Trans45day, BIAge, CHF, NursingNoServ

b. Dependent Variable: DD_Tran2007PdClaimsx12mo

Figure 12

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7E+011	25	2.637E+010	250.350	.000[a]
	Residual	2E+011	1632	105320813.4		
	Total	8E+011	1657			

a. Predictors: (Constant), SL3, SL1, SupportNone, CerebralPalsy, TransportationDistance, ComplexMedicalCondition, Laundry2, Trans67day, NS_3, CoOccurringMentalHealthDiagnosis, SupportOnetoOne, HighRiskBehavior, TransNone, NursingMonthly, PsychotropicMeds, SupportPart, Mobility_Level_3, GMI, Laundry4, SL2, Waiver, Trans45day, BIAge, CHF, NursingNoServ

b. Dependent Variable: DD_Tran2007PdClaimsx12mo

Figure 13

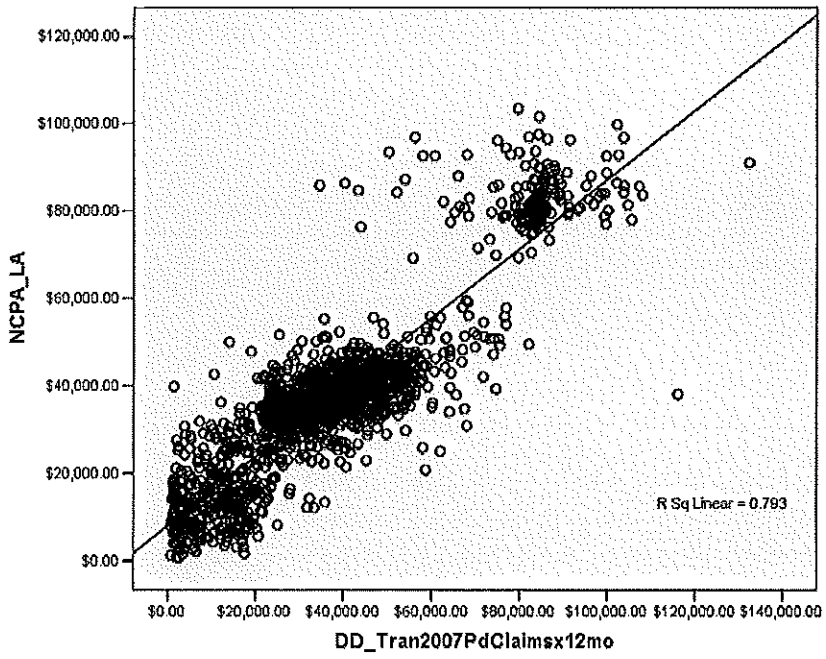
Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			95% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	29005.052	2467.552		11.755	.000	24165.149	33844.955		
	Waiver	9709.839	1221.667	.165	7.948	.000	7313.639	12106.039	.295	3.391
	NursingNoServ	-8487.342	1894.687	-.105	-4.480	.000	-12203.616	-4771.069	.230	4.341
	NS_3	-7696.676	829.597	-.134	-9.278	.000	-9323.863	-6069.488	.612	1.635
	SupportPart	-3608.868	741.887	-.074	-4.864	.000	-5064.019	-2153.717	.550	1.817
	GMI	-62.859	24.881	-.035	-2.526	.012	-111.661	-14.057	.649	1.540
	SupportNone	-7965.559	1983.858	-.051	-4.015	.000	-11856.726	-4074.374	.781	1.280
	HighRiskBehavior	2292.966	1011.808	.030	2.266	.024	308.387	4277.544	.745	1.342
	CerebralPalsy	3709.258	834.443	.055	4.445	.000	2072.565	5345.951	.821	1.217
	Trans67day	4697.383	1877.769	.032	2.502	.012	1014.292	8380.474	.784	1.275
	Laundry2	1491.209	675.287	.028	2.208	.027	166.689	2815.729	.793	1.261
	TransNone	1892.101	858.475	.041	2.204	.028	208.272	3575.929	.375	2.669
	Mobility_Level_3	1896.637	1047.438	.025	1.811	.070	-157.828	3951.102	.664	1.506
	PsychotropicMeds	514.215	597.354	.011	.861	.389	-657.446	1685.876	.719	1.391
	NursingMonthly	-6802.618	2035.361	-.074	-3.342	.001	-10794.812	-2810.424	.261	3.834
	Laundry4	-1505.887	674.399	-.032	-2.233	.026	-2828.666	-183.108	.614	1.630
	BtAge	-526.311	138.687	-.072	-3.796	.000	-798.295	-254.328	.355	2.816
	TransportationDistance	3860.686	897.317	.050	4.302	.000	2100.671	5620.700	.920	1.087
	Trans45day	5592.308	839.905	.125	6.658	.000	3944.902	7239.714	.360	2.776
	SupportOnetoOne	3138.987	994.230	.040	3.157	.002	1188.886	5089.088	.795	1.257
	ComplexMedical Condition	-1197.362	1124.385	-.012	-1.065	.287	-3402.752	1008.028	.930	1.075
	CoOccurringMental HealthDiagnosis	94.240	713.986	.002	.132	.895	-1306.185	1494.665	.769	1.300
	CHF	4650.860	1034.205	.102	4.497	.000	2622.352	6679.368	.248	4.028
	SL1	-1033.151	1142.412	-.015	-.904	.366	-3273.898	1207.597	.471	2.123
	SL2	17460.270	1556.933	.159	11.215	.000	14406.471	20514.068	.631	1.585
	SL3	44888.759	1267.149	.639	35.425	.000	42403.348	47374.169	.390	2.565

a. Dependent Variable: DD_Tran2007PdClaimsx12mo

By applying the NCPA (without the margin method applied) with the Living Arrangement (LA) to the participants' inventory scores we yield a very good NCPA_LA Plan Amount that is strongly correlated R^2=.793 with the DD + Transportation costs (Figure 14), this means that by including the LA, the CPA is able to predict the claims cost with greater capability.

Figure 14



Recommendations

Based on this analysis, three options are recommend (modify the current CPA margin method, use New CPA and margin method, or use a model with LA included) that could be incorporate into Idaho Adult DD Individualized Budget Process in order to gain a greater predictability calculated budget plan amount.

1) Since, we find that the original CPA is a good model that has the capability of predicating the budget amount well; we could continue to use the CPA model with a modification to account for a margin. Rather, than using the 5% method, we would use a greater margin, such as 55% and if the difference between the CPA and PYB is greater than 55% then the PYB would be used.

2) Or by utilizing the inventory data create a variable that estimates if and what Living Arrangement that the participant would most likely be in. Then using that estimated variable include that along with the other inventory variables to run an new regression model that would yield new weights that would be used for the budget calculation. Another, option is that we could include the living arrangement as a variable in the inventory assessment and include that LA variable in our regression model to derive a new equation to be applied to the budget calculation tool.

3) The third option would be to use the New Calculated Plan Amount (NCPA) budget model and incorporate the margin bounds where applicable based on the statistical evidence from the analysis performed specified in this report, where:

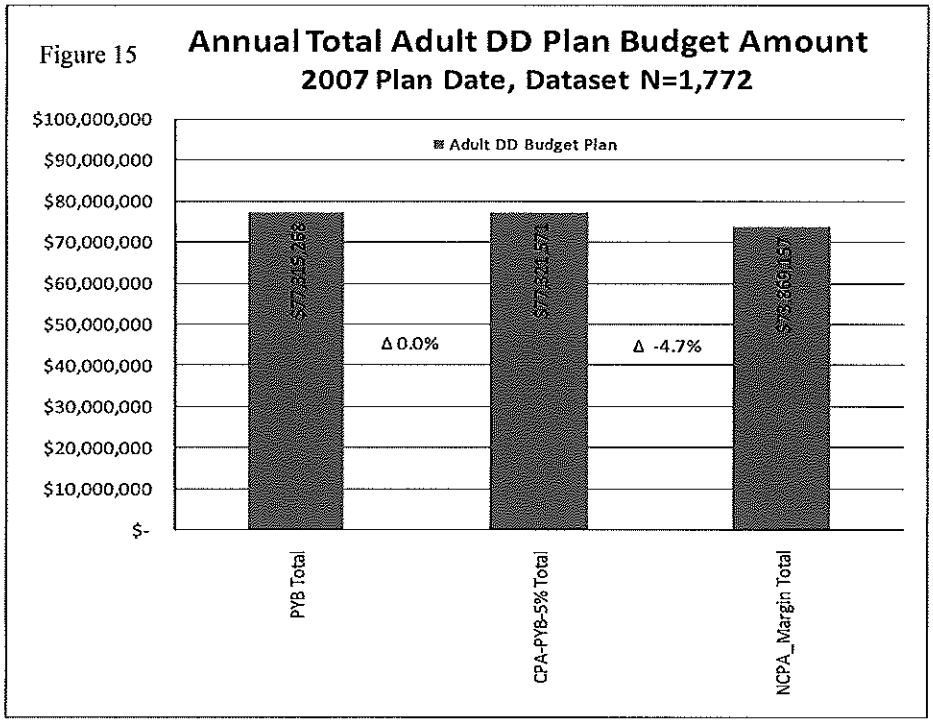
a) If NCPA is less than $1,813.78 then apply NCPA upper margin plan amount.
b) If the NCPA is beyond -55% away from the PYB then apply NCPA upper margin plan amount.
c) If the NCPA is greater than 55% away from the PYB then apply NCPA lower margin plan amount.
d) If the NCPA is within -55% and 55% from the PYB then the NCPA will be used.

The intent of utilizing the PYB as a reference is to account for the costs of the participant that may not be capture by the inventory items and by being able to have the flexibility of using the lower, mid or upper NCPA allows for a better calculated plan amount that reflects the difference of the participants needs not strictly captured by inventory data.

By using this NCPA budget model method, which tends to predict 4.7% percent lower than the PYB, nevertheless the NCPA correlates with the paid claims and PYB (since PYB is strongly correlated with paid claims). This means that by using the NCPA Medicaid would be able to lower its Adult DD costs, but keeping in line to what the participant needs (as best we can estimate the needs based on the inventory data).

Based on the dataset of 1,772 (sub set of plan year of 2007), the sum of the PYB was $77.3 million, and a sum of for the NCPA of $73.9 million, a difference of $3.4 million or a 4.7% reduction in the sum of DD budgeted amount (Figure 15).

Figure 15



The goal of using a calculated budgeted amount is to use a methodology that is based on the 'need' of the participant based on the evaluated inventory needs assessment. The CPA and the NCPA model does in fact rely on the participant's inventory values, and based on a multi-variable regression model analysis using the inventory items as the independent variables, the key inventory items that were found to influence the DD costs were used in the NCPA model. Nevertheless, there may be cases where the model does not capture extenuating circumstances of a particular participant, so a process of handling deputed budget amounts may need to be established to evaluate such outliers. However, for the most part the NCPA should fall in line to the participant needs and should resemble what they may have been assigned based on the PYB, of those that the NCPA predicted higher than the PYB (n=760) had an average of $8,691.88 higher and those that the NCPA predicted lower than the PYB (n=1,012) had an average of -$9,932.74 lower than the PYB, or an average net difference of -$1,944.75. Given that, there is an average difference of -$1,944.75, from the dataset of 1,772 that equates to a total of $3.4 million that could be reduced from the annual total of Adult DD Individual Budgets.

Conclusion

This report presents the analysis that has been done to examine the fit of the current model and the examination of other possible models that could be used to enhance the predictability of the adult DD participant's individualized budget. As demonstrated within this report, opportunities do in fact exist to gain a greater predictability within a new DD individualized budget calculation.

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